REPORT OF THE CHIEF OF THE BUREAU OF HOME ECONOMICS

UNITED STATES DEPARTMENT OF AGRICULTURE,
BUREAU OF HOME ECONOMICS,
Washington, D. C., September 1, 1927.

SIR: I have the honor to present herewith the report of the Bureau of Home Economics for the fiscal year ended June 30, 1927.

LOUISE STANLEY, *Chief.*

Hon. WILLIAM M. JARDINE,
Secretary of Agriculture.

The fourth year of the Bureau of Home Economics was completed on June 30, 1927. The investigational work in foods and nutrition, textiles and clothing, and economic problems has been organized on the basis of projects which must by their nature extend over several years. This report is therefore largely a statement of progress. In the cases where these studies have been under way sufficiently long to yield definite results, they have been issued in the form of research bulletins and papers. The increasing demand for these publications indicates the widespread need for more extensive research in home economics.

During the year a total of $127,244 was available. The increase of $10,000 over the preceding year was appropriated for an expansion of the dietary studies. This made it possible to double the amount of work on this project. Still more rapid expansion of these studies is necessary if the bureau is to be in a position to help farmers adjust their production program to the nutritive needs of the public.

These studies of dietary habits, with analyses to find how completely the foods consumed meet the nutritive needs of the individual or the group, are of twofold significance. They furnish information for the guidance of production and also form the basis for educational programs of nutrition agencies. The influence of such accredited agencies in molding good food habits is too well recognized to require comment. Certain it is that never was such work more needed than at the present time, when much misinformation about food is being widely circulated by food faddists.

There is also need for home economics cooperation in studies of marketing methods with the idea of reducing costs and supplying products to the home maker in the form most satisfactory for her use. This will involve a study of costs of different containers and sizes most satisfactory for household use.

There has been little opportunity for the establishment of new projects or, in many cases, for the desirable development of those under way. Every effort has been made, however, to direct the work into the most-needed channels. For example, as the result of the emergency situation in the cotton market many of the studies already started on textiles have been centered on cotton. Data are being collected on the reasons for the decrease in the use of cotton materials in the home, and recommendations are being drawn up to aid in the better adaptation of standard fabrics to consumer needs.

Following the same plan, the major effort in publicity has been the radio releases prepared in cooperation with the office of information. In these, facts on meal planning, food preparation, clothing selection, budgets, and other subjects studied by the bureau have been restated in popular form that has reached thousands of home makers who were heretofore unfamiliar with the work of the depart-

ment but who were eager for just this sort of information. This service has increased the distribution of publications and has almost doubled the requests for information coming to the bureau.

Whenever possible, the bureau has cooperated with other agencies, thus seeking to increase the effectiveness of its limited funds and facilities. Arrangements have been entered into with local representatives of the Society for Electrical Development and the National Association of Ice Industries to extend the research in household refrigeration. The rapid development of electrical equipment for the home has brought a multitude of questions to the bureau. Many of these involve investigation which must be done by the industries concerned. If the point of view of the consumer is to be adequately represented, however, it is necessary for agencies well acquainted with the general problems of home making to have a prominent place in this research.

Representatives of the bureau have been active in the development of a plan for establishment in Washington of a center for child study and parent education. Funds have been obtained from a foundation and will be administered through the American Home Economics Association. As one of the cooperating agencies in this enterprise, this bureau will assist in the research program on the nutrition, clothing, and care of the preschool child.

Close touch has been kept with the home economics divisions of the land-grant colleges and help given not only in the development of national projects but also on local problems. Bibliographies and outlines have been furnished whenever possible.

PERSONNEL

The bureau suffered great loss in the death of Caroline L. Hunt, since 1909 an outstanding member of the scientific staff of the department. Miss Hunt's broad fundamental training and philosophical point of view made her a valuable contributor to the bulletins on home economics, many of which carry her name and bear tribute to years of faithful service. Her kindly spirit and wealth of human sympathy endeared her to all who came in touch with her.

Aside from this loss, there have been few changes in the scientific staff during the year. All increases in personnel have been in the clerical and subprofessional grades so as to add to the efficiency and output of the scientific staff. As projects develop there will be a greater need for service of this grade.

Increasing use has been made of student assistants from George Washington University and University of Maryland. This service will, if possible, be extended to other institutions wishing to send students for limited periods to work on special problems which the bureau is particularly well qualified to handle. Research workers from some of the land-grant colleges have also taken advantage of the equipment afforded by our laboratories.

FOOD AND NUTRITION

No new projects have been started in this division, and some of the investigations have been discontinued or curtailed in order to concentrate on the more pressing problems.

CHEMICAL COMPOSITION OF FOODS

Considerable progress has been made in the collection of data assembled for a revision of Office of Experiment Stations Bulletin 28, entitled "Chemical Composition of American Food Materials." The demand for up-to-date figures on food composition is so great that it has been decided to publish the new data in sections as soon as each is complete. Figures on the proximate composition of beef have accordingly been issued and data on other meats will be ready for publication in the near future.

The compilation of figures on fresh fruits and vegetables is also nearing completion. In many cases published data were so few that little tendency toward uniformity in composition of a particular food was apparent. By obtaining authentic unpublished analyses from the Bureaus of Chemistry and Plant Industry, from State experiment stations, from university laboratories, and in a few cases from commercial organizations, it has been possible to supplement the data so that average figures on the proximate composition of some of these foods show very small probable errors.

The reported figures on refuse in vegetables varied so widely that laboratory studies were started to show what factors influence this variation. Since many dietary computations are based on the weight of the food as purchased, further studies of the waste in preparation of food, both in institutions and in homes, are needed. It is

hoped that a plan can be developed by means of which many of these data can be collected as a part of the routine work of the institutions.

The increasing recognition of the importance of mineral constituents makes desirable the collection of data on mineral content of food, but this can not be done with the present staff.

VITAMIN STUDIES

The work on the vitamin content of foods has been continued. Methods for testing for vitamins A and D are being developed which will make it possible to avoid some of the difficulties arising from the close relationship of these vitamins. The mercury-vapor quartz lamp is used in supplying vitamin D to the vitamin-A-free basal diet.

Continuation of the experiments on lettuce has shown that the bleached leaves from the head proper contain as much vitamin B and vitamin C as the outer green leaves. The outer leaves contain on the average about thirty-two to forty times as much vitamin A as the inner leaves. Lettuce does not contain vitamin D as indicated by the line test technic of McCollum.

The determination of the vitamin A content and calcifying properties of a commercial cod-liver-oil extract has been completed. This was carried out in direct comparison with a good grade of cod-liver oil so that it was possible to judge of the value of the extract as a substitute for cod-liver oil. In this study technic for the line test has been worked out so that the calcifying properties of foods can be compared quantitatively with a fair degree of accuracy.

Two samples of honey, one of very light color and the other of very dark color, showed no evidence of the presence of vitamins A, B, C, or D. A sample of honeycomb yielded similar results.

For demonstration purposes, series or rats have been fed in such a way as to show the effects of various deficiencies in the diet. Photographs have been taken for use in a set of charts now in preparation.

COOKING MEAT FOR PALATABILITY TESTS

This bureau has continued its cooperation with the Bureau of Animal Industry and the State experiment stations in the national project on factors which affect the quality and palatability of meat. The contribution of this bureau has been along the following lines: The best standard methods for cooking the different kinds of meat, cooking cuts of known history by the standard method for the palatability test, study of specific problems arising in the adaptation of the standard method to home uses, and collection of data on the color of raw and cooked meats.

In developing standard methods the aim was evenly cooked meat with a maximum of juice and natural flavor. From a practical point of view it was essential to keep the time required for cooking to the minimum necessary for successful accomplishment of this purpose. The experimental cooking has included work on beef, lamb, cured pork, and veal. The major emphasis was on lamb and the work on the other meats supplementary to that done by other laboratories cooperating in this project. In the studies on lamb, legs, shoulders, and breasts were used as far as possible in pairs from the same animal for comparison. These were planned to show the effect of varying oven temperatures and the temperature of doneness, and of the removal of the fell. The results of these experiments in the cooking of lamb are the basis of the method for roasting lamb adopted by the committee in charge of this phase of the work on the national project.

One hundred and fifty-four rib roasts of beef from 14 States, 165 legs of lamb from 6 States, and 14 cuts of fresh pork, all from experimentally fed animals, were cooked according to standard directions and judged for palatability. The data from these experiments have been sent to the Bureau of Animal Industry to be correlated with production factors and other determinations. One or more members of the staff have served on the committee testing the palatability of meat, and have cooperated in the revision of the score card.

In applying the results of this experimental cooking of meat to home use, additional problems have arisen. Such questions as initial searing of the roast, oven temperatures, and the most efficient use of electric ovens are being given special attention.

DEVELOPMENT OF RECIPES

Some 300 recipes were developed, tested, or modified for use in the radio and other publicity services. Special attention was given to short cooking of vegetables which conserves the min-

eral and vitamin content. So far as possible, requests for special recipes were met and recipes sent in by radio listeners were tested and included in succeeding releases if they were of broad enough application.

Over 100 dishes were prepared for photographs and models to be used in exhibits, bulletins, posters, and press releases. Much of this work is done at the request of other bureaus and requires considerable time. A series of suggestions and recipes for the use of Neufchatel and cream cheese was worked out at the request of the Bureau of Dairy Industry for the revision of the bulletin dealing with the manufacture and use of these types of cheese.

Brief studies were undertaken to show when the so-called waterless cooking is an advantage and how it can be carried on with the utensils generally found in the home kitchen.

Quantity recipes are being developed, with special attention to those most desirable for school lunches, nursery schools, and day nurseries.

HOME PRESERVATION OF FOOD

Continuing studies on home canning, blackberries and beets were canned in glass and tin for further observation of color changes. The results from canning whole wheat and suet pudding in the pressure cooker were checked and the directions altered accordingly. Work on canning asparagus has been continued in order to check the most desirable times and temperatures.

The lamb canned last year with and without added fat was opened and scored. All had been hot packed and processed in a pressure cooker at 15 pounds pressure for a minimum of 50 minutes. There was no spoilage in either lot. The method recommended for canning lamb has been written up for inclusion in the revision of the bulletin on the butchering and use of lamb on the farm, which will be issued jointly by this bureau and the Bureau of Animal Industry.

In cooperation with the Bureau of Plant Industry, some special studies were made of the suitability of different varieties of strawberries for preserves. In connection with this a comparison was made of the different home methods of preserving strawberries.

A study of the pickle recipes being suggested for home use indicated that an analysis and simplification of these was desirable. Using the methods suggested by the Bureau of Chemistry, vegetables were fermented and brined under conditions comparable to those found in the home and combined into various pickle mixtures. Special attention has been paid to desirable combinations of spice, vinegar, and sugar, and to methods which would insure a crisp product with a minimum of spoilage. Many of the old-fashioned pickle recipes yield a product which will not keep in the storage places provided in the modern heated house. When the product is processed to insure keeping, unless the operation is carefully controlled, the material softens. Typical pickles have been prepared and submitted to various individuals for scoring. These have been held over the year for observations on keeping quality. It is proposed to mimeograph these recipes and send them out through the extension service for further testing and comment. The final results will be brought together in bulletin form.

HOUSEHOLD REFRIGERATION STUDIES

The study of household refrigeration begun last year on one electrical unit lent by the manufacturers has been continued. Records of the temperature of the room and certain points in the box, the current consumed, and the periods of the operation of the motor are now being analyzed. Most of the time the food chambers were empty, but during certain periods large quantities of meat were stored. Through a cooperative arrangement with manufacturers of both mechanical and ice refrigerators, as well as with the ice industry, more extensive research will be undertaken the coming year.

ECONOMIC STUDIES

FOOD CONSUMPTION OF FAMILIES

The data for a study of the diet of farm families are taken from the schedules of the survey of farm standards of living made jointly by the Bureaus of Agricultural Economics and of Home Economics. The average quantity and value of each foodstuff consumed by farm families have been determined for 840 farm families. The nutritive value of these average diets has been calculated in terms of calories, protein, calcium, phosphorus, and iron, and the distribution of the total calories and the total value among the various fuel groups has been shown. Similar data are now available for 2,677 families in nine States.

Two preliminary reports on these results have been issued, one for 1,331 farm families in Kansas, Kentucky, Missouri, and Ohio, and one for 86 farm families in Vermont. For 382 families in Ohio, the diet of each family has been analyzed from the standpoint of nutritive value and money value and the relation of these to the amount of food furnished by the farm. This brings the total number of individual family dietaries analyzed to 1,253. A bulletin is now being prepared which will embody the results of the analyses of all the individual family dietaries.

A summary was prepared last year bringing together in tabular form data on previous food-consumption studies made in the United States. The demand for this material has been such that it will be extended, and the essential points published in connection with the bulletin on food habits of farm families.

DIETARY SCALES AND STANDARDS

In analyzing a diet for adequacy it is necessary to have a standard measure of the amount of food needed per adult-male unit and a scale by means of which the family needs may be expressed in terms of such a unit. In the summary of dietary studies it was found that no less than five such scales and standards have been in use in the United States. Analysis of these reveals inconsistencies, and their use makes a comparison of results from different studies difficult if not impossible.

A detailed study has been made of these dietary scales and standards, which was published in the technical bulletin series of the department. A new double scale is proposed which embodies the more recent findings from investigations in nutrition. This scale will be used in the further studies of dietary habits made by this bureau.

METHODS OF COLLECTING DATA ON FOOD HABITS

At the conference on dietary habits called by the bureau in April, 1926, the question was raised as to the comparative value of the different methods of collecting data for these studies. This question was further considered at a meeting of representatives of various organizations at Minneapolis in June, 1926, and an outline prepared for a proposed cooperative study. It was the opinion of this group that more data needed to be collected before a national committee could function effectively. The following studies have been initiated in order to furnish this:

The accounting method is being used by a number of colleges and universities for collecting data on food consumption of individual families or of institutional groups. A comparison of the results obtained by the accounting and by the survey method of collecting food-consumption data will be made. It will be based on about 200 account books which are being kept this year and upon that many or more records collected by the survey method. Material may also be used from the dietary survey made by the Office of Home Economics in 1917–18 and from the records of workingmen's families collected by the Bureau of Labor Statistics in 1918–19. Besides the method study, some interesting figures on the food consumption of families at the minimum, families of skilled workmen, families of professional and business men, and farm families will be obtained from this material.

Under the Purnell Act a number of studies are being made in which the food-consumption data are of a qualitative nature. In many of them the nutritive condition of the individual is ascertained, and this is correlated with the individual's food habits. Studies of that kind open up many questions that need investigating, such as criteria for evaluating the diet and for ascertaining the nutritive condition of the individual, and suitable statistical methods of studying such a correlation. An investigation of this kind is now under way. The data collected by the Children's Bureau of the United States Department of Labor are being used for this qualitative study. Quantitative material collected in Mississippi will be used for comparison with the results obtained by the qualitative method of studying food habits.

CLOTHING EXPENDITURES OF FARM FAMILIES

The work of analyzing the data on clothing expenditures of farm families obtained from the survey of farm standards of living has been continued. A preliminary report on the average clothing expenditure of 86 farm families of Franklin County, Vt., during 1923–24 has been issued. This report shows the expenditures for each article of clothing purchased during the year for husbands and wives and for sons and daughters of seven different

age groups. There is also shown the average number of persons purchasing each garment, the average number of articles of each kind purchased per person, and the average cost of each article.

For 2,010 farm families from 7 States material has been analyzed to show the total yearly expenditure for clothing for each of 15 age and sex groups and the relative expenditure for each group in terms of the husband's expenditure, and also the distribution of the total expenditures among 6 different classes of clothing. The average number and cost of home-made and of purchased garments for each of the four value-of-living groups and for all groups combined has been ascertained for 728 farm families.

TRENDS IN COTTON CONSUMPTION

A study of the changes over the past five years in consumer-demand for cotton in clothing and in household articles, and of the reasons for the changes, had been undertaken as a part of the program of the department to aid the situation in the cotton market. Data are being collected from all available printed material, by letters to various organizations, by interviews, but chiefly by a questionnaire circulated to consumers through the extension service, home economics departments in colleges, universities, and high schools, and through women's clubs. To date some 650 questionnaires have been received, and several hundred more are promised.

HOUSEHOLD ACCOUNTS AND BUDGETS

A number of alternate forms for planning and recording family expenditures were prepared and tested out with farm and with city home makers. The results have been embodied in an account book for family expenditures and a bulletin illustrating and explaining several methods and forms for planning and recording family expenditures. Both of these have been submitted for publication.

Most of the data on family expenditures so far collected by various agencies have been obtained by the survey method. While it is recognized that some error must be present in such figures, the extent and nature of this error are not known. Before collecting new data on family expenditures, therefore, it has seemed desirable to compare the figures obtained by the survey schedule with those obtained from accounts kept by home makers.

Plans and blanks for such a study were drawn up and were first used in July, 1926, with a group of 50 farm home makers in Maryland. Survey schedules were taken for all the families for the year 1925–26. Twenty-five of these home makers began keeping itemized accounts and sending in weekly records. Twenty-two of these home makers finished the complete 12 months on June 30, 1927. Survey schedules will be taken for the 50 families for the year 1926–27. Comparisons will then be made between the four sets of survey schedules (account and nonaccount keeping families for 1925–26, and for 1926–27) and the account books.

Similar data have been obtained for five farm families in Ohio. Account books have been obtained for 30 families in Illinois, and it is expected that survey schedules will be obtained from the same 30 families and, if possible, from 30 comparable but nonaccount-keeping families at the close of the account year (January-March, 1928). Through the Bureau of Welfare of the District of Columbia, division of mothers' pensions, 90 family account books will be available between November 1, 1927, and January 31, 1928. These will be compared with survey schedules taken for 1927 from these or comparable families. It is expected that comparable survey schedules will be obtained from members of the trades in Washington, D. C.

During this year 76 professional and business families in various parts of the United States have been keeping detailed accounts and sending in weekly reports. Survey schedules from comparable families will be obtained during the summer of 1927 from the women attending the Vassar Institute of Euthenics, through graduate students at Columbia University, and through the home-economics departments of other colleges and universities. Survey schedules will also be obtained from some of the account-keeping home makers in 1928. This will give data upon which a comparison of the survey and accounts methods may be made for four different classes of American families, based on some 253 account books and about twice that number of survey schedules.

Studies on suggested budgets for farm families and expenditure scales for farm families by age and sex are being continued. These will be published as soon as sufficient data have been collected to assure representative figures.

USE OF TIME BY HOME MAKERS

Weekly time records from over 500 home makers are now on hand, and a total of about 500 more have been obtained by Purnell workers in the four States which are cooperating. The editing and classifying of these records is being pushed as rapidly as possible. Detailed directions for all of this work are now complete, and copies have been sent to the Purnell workers in Oregon, Washington, and Rhode Island who are classifying the records which they have taken. The results from these States will thus be comparable with those of the bureau. The records obtained by the Purnell worker in Idaho have been sent to the bureau for classifying and for use in its reports.

Of the 500 records about 300 are from farm homes and 200 from town and city homes. One hundred additional records from farm women are expected within the next few months, and a report on the farm records will then be made. A trial analysis of the first 100 farm records indicates that about 400 are necessary before averages can be made and conclusions drawn. Since comparisons can be made between these 400 records and the similar number obtained by the three Purnell workers, it is probable that a still larger number of farm records will not be needed.

The analysis of the results from town and city home makers will not be started until several hundred additional records have been received and classified. Owing to the great variety of the homes from which these records come, it will doubtless be necessary to break them into two or more groups, each group including several hundred home makers. It is hoped that enough records can be obtained and classified during the year from one of these groups to justify a report.

ECONOMIC VALUE OF HOME MAKER'S TIME

One of the questions concerning the home maker's job which has repeatedly appeared during the last few years is what her time is worth in dollars and cents when spent on her various tasks. Answers to this question would undoubtedly encourage a greater appreciation of the value of the home maker's work, and, more significantly, they would give her a more definite basis for choosing the tasks on which she will spend her time. Every home maker in this industrial age is constantly deciding whether to do her own baking, canning, sewing, laundering, or cleaning or to have this particular task done for her by hired help or by an outside agency while she spends her time on some other work. At present she has little or no information as to the comparative economic value of her time when spent in these various tasks.

In placing an economic value on the home maker's time, the cost of a paid substitute for her unpaid labor must, of course, be used. Two types of substitutes are available—one the services of the paid worker in the home and the other the services or goods of the agency which performs the same task outside of the home.

During the past year a study has been started using the second type of substitute. The cooperation of a small group of Washington home makers was obtained, the blanks were provided upon which they recorded the time and money costs of doing a given task in their homes and also the amount of money and of their time which would have been required had they purchased articles or services of similar quality outside. The studies were made by the home makers during the regular course of their housekeeping, and reports were obtained covering 15 tasks. The variation shown in the value of their time was very great, ranging from almost nothing to over $2 an hour. Seven of the studies gave a value of less than 50 cents an hour, seven a value of from 50 cents to $1 an hour, four of from $1 to $2, and four of over $2.

On the basis of the experience with these home makers, the plans and blanks for the study were revised, and sets have been sent to a number of extension and college workers. Further cooperation of this sort will be sought during the coming year, emphasis being placed, as far as is consistent with the needs of the State workers, on tasks which are relatively standardized and frequently done by home makers, such as bread baking and certain canning and sewing jobs.

A large number of studies from different home makers will, of course, be needed before any conclusions can be reached, and these results will probably need to be supplemented by studies under controlled conditions in a home or laboratory.

The second method of placing money value on the home maker's time, in which the cost of the paid worker in the home is used, will more readily yield results. For this evaluation two

sets of figures are required—one the hours spent by the home maker per week or year on each kind of task and the other the hourly wage or salary rate paid to each kind of hired domestic worker. The first set of figures will be available during the year from the study of the present use of time by home makers. The figures on wage and salary rates will be obtained from employment agencies and from home makers. The workers for whom the rates of pay are obtained must, of course, compare as closely as possible in quality and speed of work with the type of home maker for whom the evaluation is being made.

TEXTILES AND CLOTHING

UTILIZATION OF COTTON FABRICS

In view of the serious cotton situation, a study has been made of the cotton fabrics on the market with a view to suggesting ways in which they could be modified so as to meet better the needs of the consumer. Conferences were held with pattern companies, advertising agencies, commission men, and representatives of commercial textile organizations as well as with home economists. The results have shown that design is the dominant element in the consumers' estimate of the value of fabrics at the present time, and, if cotton fabrics are to be used extensively, design must be given more attention. The force of education becomes greater every year, the opportunities to develop taste increase, and the textile producer who does not develop artistic fabric designs as well as new ways of using standard materials will lose opportunity for profit and for service.

If the situation is to be adequately met from a national point of view, much research must soon be undertaken. The following are some of the most outstanding questions for investigation: Commercial factors influencing costume design and silhouette; styling of fabric design and the relation of fabric and yardage requirement to costume design and silhouette; present manufacturing problems in the development of fabric design and the most effective ways of increasing interest in the better design and styling of cotton fabrics; mediums through which adequate information may be distributed to consumers in regard to the merits and effective use of cotton. This should include an analysis of the different policies used by retail groups to sell and advertise cotton fabrics with emphasis upon the relation of these to consumer-purchasing habits. The results of such a study could be made effective through cooperation with agencies training in retail selling. Studies should also be made of the organization of methods of marketing and the national advertising of cotton fabrics. Such an investigation would do much to contribute to a better understanding and solution of some of the intricate problems now existing in the industry.

During the past season a preliminary study was made of the adaptability of American-made cotton fabrics to dresses designed in accordance with the present vogue. Appropriate dress designs for various types of figures were developed and carried out in cotton dresses. These dresses are to be used for exhibit purposes, and photographs of them are being distributed through publicity channels.

The models used in the Sesquicentennial exhibits to show appropriate and inappropriate costume design brought many requests for similar traveling exhibits. Sets are, therefore, being made and will be lent through the Office of Cooperative Extension Work. These also emphasize the use of cotton in clothing. Another exhibit is being prepared showing the most attractive ways of using cotton for household purposes.

FABRIC FINISHING

Studies on the refinishing of cotton fabrics in home laundering so as to simulate more nearly the original finish have been continued from last year. Sizing mixtures of various compositions have been studied with particular attention to the use of American agricultural products. For instance, at the request of the Bureau of Plant Industry, tests were made on rice starch and dasheen starch with the hope of extending their use in the textile industry and in home laundering. Throughout all this work it has been necessary to develop laboratory methods, since the terms applied to the properties of sizes and sized material have been very vaguely defined and no methods of measuring them worked out. Particular attention has been given to methods of determining the stiffness and pliability of sized fabrics.

The final experimental work on stiffness has been completed. Formulas using various kinds and quantities of starch and foreign ingredients have been studied as well as the effect of

varying the concentration of the mixture and the time of cooking. The mathematical interpretation of the data is now under way.

An instrument for testing the pliability of starch films has been developed and is being tried and improved. This has been standardized by means of cellophane strips. Investigation of the various methods of measuring the thickness of these films has also been made.

In connection with the studies on cotton, an investigation has been made of different cotton fabrics after laundering to determine the effect of washing on the original finish and the possibility of reproducing this finish with the aid of household mechanical devices. The formulas developed by the sizing studies were used and investigations made of the effects produced by varying the temperature, pressure, and padding of rolls on an electric ironer. The results obtained by these methods were compared with those produced by stretching devices. This work is still under way.

LAUNDERING

The investigations on the most effective temperature for the removal of soil from textile fabrics have also been continued from last year. An experimental washer for this work has been planned and built. The studies on the composition of the artificial soiling mixture to be used have been completed, as well as the series of experiments made to determine the type of fabric best suited for this work. Additional studies were made of methods of desizing cotton materials, and these will be continued as a separate project.

Studies of the scorching temperature of textile fabrics during the process of ironing are also in progress. As a part of the preliminary work of this project investigations have been made of various methods of determining the amount of chemical decomposition which cotton fabrics have undergone when ironed at too high a temperature. The use of the viscosity of cuprammonium solutions, of copper numbers, and of the alkali solubility of partially decomposed cotton has been studied. It is hoped that this work can be carried forward during the coming year.

MODERN TRENDS IN HOME SEWING

The results of the study of the clothing practices of 1,981 women from 32 States have been compiled, and the report is in press. These show that nearly three-fourths of the women who reported were making nine or more kinds of garments for men, women, and children. As was expected, more of the women who are sewing at home live in the small, rather than in the larger communities. When grouped according to income, the women who did the most sewing fell in the $2,000 to $2,999 group rather than in the lower-income groups.

It was shown in a very striking fashion that fitting was one of the greatest difficulties these women encountered in making garments. Farmers' Bulletin 1530, Fitting Dresses and Blouses, was prepared and issued in order to assist in meeting this need. Another difficulty which was mentioned in a large number of cases was choosing becoming and practical designs. Ready-to-wear garments are popular largely because women can see how the completed garment looks on them.

CHILDREN'S CLOTHING

A study of the weight and kinds of garments being worn by children under 2 years of age in various parts of the country has been undertaken as a part of an extensive study of children's clothing. Data are being gathered during a typical summer and a typical winter month and an attempt is being made to discover the type and amount of clothing that is considered by practical experience to be the most satisfactory for different climatic conditions. Twelve home economics departments in various parts of the country are cooperating in this project. The clothing of 200 children was weighed and studied in Washington, D. C., last winter and a similar number will be reported during the summer.

The influence of clothing on the skin temperature of infants is being studied in order to obtain one measure of the comfort of infants dressed in fabrics of different composition and construction. The literature has been reviewed for this investigation, the preliminary experiments completed, and the apparatus to be used purchased and calibrated. It is planned to study the effect of wool, cotton, union, and rubberized fabrics on skin temperature.

A study of the designs of children's rompers as found in ready-made garments and patterns has been made. Approximately 60 different designs were included. These were analyzed from the standpoint of hygienic quali-

ties, comfort, ease of laundering, and adaptation to child training. Some of the results are embodied in a circular on children's rompers which has been submitted for publication.

As the result of conferences held with persons in charge of children's clothing in the various orphanages of the city and with interested mothers, a lantern slide set is being prepared which shows some of the most outstanding advantages and disadvantages of various types of children's garments. Approximately 300 photographs have been taken in the preparation of this set, and the project has resulted in the addition to the files of an excellent series of photographs of children's clothing which will be valuable in many connections.

THE RELATION OF CLOTHING TO HEALTH

As a part of the preliminary work looking to investigations in the relation of clothing to health, a bibliography of articles and books dealing with this subject is being compiled. Approximately 1,000 books and articles have been reviewed, and it is planned to include and annotate all that have scientific interest.

STUDIES IN WOOL

A popular bulletin on the selection of woolen fabrics is now in preparation and study will be made on the care of woolen garments. The importance of wool to agriculture and the manufacturing interests of this country is so marked that more attention should be given to the consumer's problems in the selection and care of such garments.

HISTORICAL BACKGROUND FOR HOME ECONOMICS

A collection is being made of historical material throwing light on the development of the home-economics movement. Since much of the work during the early period was associated with individuals, a series of 12 biographical papers has been prepared showing contributions to the scientific and philosophical background of home economics. So far as possible, this material will be issued as articles in journals or used for talks before groups of students.

INFORMATION AND EXHIBIT SERVICE

Radio releases have been the feature of the information service. A special writer of the staff of the office of information put into conversational form facts on foods and nutrition, clothing, and other home-economics topics furnished by the bureau. These releases, under the caption "Aunt Sammy's Household Chats," have been sent five times a week to about 25 stations for broadcasting. Judging by the letters that have come from broadcasters and home makers representing every State, the radio is one of the best possible ways of popularizing scientific facts on home problems. A total of 176 of these releases of approximately 1,500 words each have been distributed. In these have been included 300 tested recipes and 130 menus for well-balanced, appetizing meals that could be prepared easily and at moderate cost.

Technical and popular information has been sent out in the established channels as bulletins, articles for periodicals and scientific journals, and press items.

The following publications have been issued in the regular series of the department:

Stain removal from fabrics: Home methods. Division of Textiles and Clothing. Farmers' Bulletin 1474.
Convenient kitchens. Greta Grey. Farmers' Bulletin 1513.
Principles of window curtaining. Mary Aleen Davis. Farmers' Bulletin 1516.
Fitting dresses and blouses. Maude Campbell. Farmers' Bulletin 1530.
Dietary scales and standards for measuring a family's nutritive needs. Edith Hawley. Technical Bulletin 8.
Proximate composition of beef. Charlotte Chatfield. Department Circular 389.
Planning your family expenditures. Chase G. Woodhouse. Miscellaneous Circular 68.
Score cards for judging clothing selection and construction. Ruth O'Brien, Maude Campbell, and Mary Aleen Davis. Miscellaneous Circular 90.

Eight articles describing various types of work in the bureau were contributed to the Yearbook of Agriculture for 1926.

Manuscripts for three more bulletins and drawings for a series of charts on kitchen planning are ready for printing.

The distribution of free copies of the 27 bulletins of this bureau on various economics topics has totaled 2,129,946. This is exclusive of sales

through the Government Printing Office, which run well up in the thousands.

A bibliography on footwear was issued in mimeographed form, bringing together 200 references in English to books and periodical literature on the fitting of shoes, foot structure, corrective foot exercises, shoe history and design, the manufacture of shoes, hosiery, and shoe care and repair.

A selected list of Government publications on housing and equipment was also mimeographed for distribution as reference material for teachers and professional home economics workers.

The volume of material supplied to newspapers and magazines has increased by 50 items, making a total of 250 during the year. These include special articles written in response to editorial request, as well as brief items popularizing facts on food selection and preparation and the choice and use of fabrics in the household.

An exhibit of eight booths representing different phases of the work of the bureau was sent to the Sesquicentennial in Philadelphia for display during the summer and fall of 1926. Since then two of these booths dealing with foods and nutrition have been reconditioned and some new features added. At the request of the American Child Health Association and the American Medical Association, these booths were displayed for the benefit of delegates to the conventions of these two organizations meeting in Washington during the spring of 1927. At present this material is forming part of the department's exhibit at the Interstate Highways Exposition at Reno, Nev.

A booth entitled "The Kitchenette Steak" was planned by this bureau as one of the features of the International Livestock Exposition in Chicago in 1926. Two displays suggesting ways of cooking and serving poultry and poultry products have been prepared for the exhibit at the World Poultry Congress held this summer in Canada. Wax models of 19 kinds of these foods were made under the direction of the bureau from foods prepared here.

The exhibits of washing machines and sewing machines have been maintained, and advantageous contacts made with a large number of manufacturers. The ironing machine exhibit has been developed as far as space permits.

U. S. GOVERNMENT PRINTING OFFICE: 1927